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"CONCERNING A METHOD FOR FINDING A PARTICULAR
INTEGRAL." NOTE ON PROFESSOR COBLE'S ARTICLE.¹

By HENRY P. MANNING, Brown University.

The method of undetermined coefficients for obtaining the particular integral in certain cases of linear differential equations is much easier and shorter than the other methods given in our text-books, except perhaps some of the mysterious symbolic methods, and it is at least as short as these. Professor Coble expresses the opinion² that Cohen was the first to publish it, and this may be true so far as English and American texts are concerned. Neither Johnson, nor Murray, nor Forsyth mention it. The method, however, is to be found in the second edition of the third volume of Jordan's *Cours d'Analyse*³ which appeared some years earlier. Cohen explains the theory a little differently, but Jordan's explanation, though brief, is very clear and much simpler than Cohen's. It is so simple, in fact, that with a little elaboration it can be taught to undergraduate academic and engineering students, even when not in their books, and it can be applied not only to forms of second member that occur most frequently when the equations have constant coefficients, but also to cases of the so-called homogeneous or Cauchy equations, and to some other types that occur. It is analogous to the method of differentiation employed for certain equations that are not linear. From a given linear differential equation is obtained an equation of higher order with the second member zero, and, when the complementary function of this equation can be obtained, that part which does not belong to the complementary function of the given equation is determined by substitution so as to satisfy it as a particular integral. In practice we usually know the form of the result and have only to substitute and determine the constant coefficients.⁴

RECENT PUBLICATIONS.

REVIEW.

Analytic Geometry. By EDWIN S. CRAWLEY and HENRY B. EVANS. Philadelphia, E. S. Crawley, 1918. 12mo. 14 + 239 pages. Price, \$1.60.

This book begins with seven preliminary pages given to review formulas from Algebra and Trigonometry and a set of tables, one of the three place natural values of the trigonometric functions of angles measured in radians and degrees for each degree from 0^0 to 90^0 ; another of three place common logarithms of numbers from 10 to 99; another of two place Napierian logarithms of numbers from 0 to 10.9; and two tables for Napierian anti-logarithms, one for positive and the

¹ In this MONTHLY, January, 1919, pages 12-15.

² In a footnote on page 13.

³ C. Jordan, *Cours d'Analyse de l'Ecole Polytechnique*, Tome 3, 2d ed., Paris, 1896; arts. 132-133. pp. 160-163.

⁴ C. E. Love explains this method briefly (*Calculus*, New York, 1916, pp. 313-315).